August 17, 1955

Dear Dr. Ørskov

Thank you very much for the cultures, which arrived in good order today, and for your letter of the 12th. I had not realized there was such a concordance between the biochemical and serological variations in these serotypes.

I am about to leave the laboratory for about a week, but will examine the strains upon my return. Thank you for your offer to send additional strains— I will probably renew my request when I have considered the matter more fully.

Have you published your detailed findings on the correlation of serological and fermentation diagnosis?

May I ask a further question: we are interested in the question (indeed the likelihood) that E. coli varieties are arising by recombination. We have been able to cross our E. coli K-12 strain with one 026B6 and with one 055B5 culture. Unfortunately, the K-12 strain is antigenically degraded, and we have not been able to cross these strains with one another, for reasons not well understood. We are interested in following the genetics of the antigens, but we shall have to find additional strains of these serotypes that can be crossed with one another before we can make any progress. In order to avoiding screening too many duplicates, I have asked that distinct varieties be made available. I seek your advice on the range of cultures that can profitably be tested for sexual fertility without undue repitition of tests on epidemically identical isolates. We have thought to concentrate on the 026, 055 and 0111 groups, as being those of the greatest interest to students of the coliforms. We have not yet typed the H antigens of the two fertile strains; when we have organized our material a bit better, I would like to ask whether you would undertake to type them fully.

But my question is whether there has been any indication of mutation in the flagellar antigen? I am aware that flagellar phase variation has not been reported, but I am curious to know whether there have been exhaustive attempts to select new antigenic forms by serum selection in semisolid agar. Our few attempts have been negative. Could negative results be due to an incomplete fractionation of H antigens that are more complex than indicated by the formulae? Has there been any indication of antigenic complexity in the H antigens (I am aware of something of the sort with O by Ewing)?

Yours sincerely,

Joshua Lederberg